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Acid mine drainage is a major problem related to coal mining. If unabated, it can severely damage the aquatic environment. Damage resulting from acid mine drainage was first addressed by common law and riparian principles. As societal values evolved and changed, common law principles alone could not effectively control this problem. Preventing and controlling pollution including acid mine drainage are important goals of the Surface Mining Control Reclamation Act[1] (SMCRA) and the Clean Water Act[2] (CWA).

Effective utilization of SMCRA, the CWA, and common law principles are essential to protect against the destruction caused by acid mine drainage. This article will examine how common law, SMCRA, and the CWA address the acid mine drainage issue independently and jointly and how improvements in the control of acid mine drainage can be achieved.

I. FORMATION OF ACID RAIN DRAINAGE

Acid mine drainage is water polluted with high acidity, sulfates, and metals.[3] Acid mine drainage forms when iron sulfides (pyrites and marcasites) in the overburden are exposed to the atmosphere and oxidize in the presence of oxygen and water. The chemical reaction produces ferrous iron, sulfates, and acidity. In other words, water passing through acid-producing material in the mine can generate and pick up large quantities of acidity. Acid mine

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[1] 30 U.S.C. §§ 1201-1328 (1988).

[2] 33 U.S.C. §§ 1251-1387 (1988).

[3] APPALACHIAN REGIONAL COMM'N, ACID MINE DRAINAGE IN APPALACHIA (1969).

drainage also occurs when air and water react with sulfur bearing minerals in refuse piles. Through subsequent reactions, the ferrous iron oxidizes to ferric iron. This in turn hydrolizes to form ferric hydroxide and additional acidity. The ferric hydroxide commonly precipitates out of solution and is responsible for the characteristic red or yellow color of acid contaminated streams. Finally, the ferric iron generated by the initial reactions may oxidize more iron sulfides, producing additional acidity. These acid producing reactions occur in a continuing cycle.

II. RIPARIAN PRINCIPLES AND THE COMMON LAW

The essence of a private nuisance action is an interference with the use and enjoyment of the land.[4] This protection also encompasses the use and enjoyment of riparian rights. The term "riparian," used as an adjective, means "of, pertaining to, or situated or dwelling on the bank of a river or other body of water."[5] The riparian landowner does not actually own the waterbody but does "own numerous rights in it."[6] The key tenet is that only persons owning land on natural watercourses possess riparian rights. Accordingly, there are no riparian rights in groundwater.[7]

The general rule is that the riparian owner has the right to have the natural flow of the surface water reach his land as well as the right to enjoy the water in its natural state.[8] Accordingly, an upstream riparian owner has no right to use the water flowing through his land so as to foul the same or render it corrupt or unfit to be used by one who holds riparian rights downstream.[9]

On the other hand, the right of the riparian owner is not one of absolute immunity from all pollution. It is subject to the right of each riparian owner to use the stream to a reasonable extent.[10] Whether the polluting of stream water by an upper riparian owner constitutes an actionable injury for a lower riparian owner turns on whether the resulting pollution stems from a reasonable use of the

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[4] WILLIAM PROSSER, THE LAW OF TORTS 591 (1971).

[5] RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, (New York, 1967).

[6] GETCHES, WATER IN A NUTSHELL 32 (1990).

[7] See *id.* at 8.

[8] Fricke v. Quinn, 41 A. 737, 738 (Penn. 1898).

[9] *See id.* at 737-38.

[10] Bennis v. Free Hospital for the Poor, 23 Dist 971 (1913).

stream. This determination is made by the court.[11]

The common law rights of riparian landowners involving protection against acid mine drainage have undergone a metamorphosis in Pennsylvania as coal companies and landowners have contested responsibility during the late nineteenth and twentieth centuries for damage caused by acid mine drainage. The protection of common law riparian principles by Pennsylvania courts during the late nineteenth and early twentieth centuries was weighed against public and economic policies promoting coal mining. In order to understand the inherent conflict between Pennsylvania coal companies and landowners, it is necessary to examine the relevant case law.

Generally, a mine owner, although engaged in a lawful business, has no right to cause an unreasonable change in the quality of stream water and render it unfit for the domestic purposes adopted by the lower riparian owner without being liable for the resulting damage.[12] The Pennsylvania Supreme Court decision in *Sanderson v. Pennsylvania Coal Co.*[13] illustrates the court's ability to mold the law according to public concerns at that time. This case involved an action for trespass instituted by lower riparian owners seeking damages for corruption of their water caused by acid mine drainage. The Pennsylvania Supreme Court held the mine operator was not responsible for acidulating the water since it resulted from the natural use of the mining property.[14] *Sanderson* reflects a time when courts went to great lengths to protect the coal industry and refused to rule in favor of a downstream riparian owner if the coal company did not divert or manipulate the water.

This reasoning, however, was not applied when the flow of water was manipulated[15] or when a public water supply was involved.[16] In *McCune*, the plaintiff was the owner of a tract of land which had been used for farming. Mine water from the defendant's mine was pumped to the surface and discharged into a tributary of the stream which flowed through the plaintiff's land. The court, in finding for the plaintiff, distinguished its reasoning from that of *Sanderson*. The court stated that the mine owner cannot divert the

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[11] *Id.* at 973.

[12] Yost's Appeal, 14 York 25 (1900).

[13] Sanderson v. Pennsylvania Coal Co., 6 A. 451 (Penn. 1886).

[14] Id. at 453.

[15] McCune v. Pittsburgh & Baltimore Coal Co., 85 A. 1102 (Penn. 1913).

[16] Pennsylvania R.R. v. Sagamore Coal Co., 126 A. 386 (Penn. 1924).

natural flow of the water in the mine, raise it artificially and thereby destroy a pure stream of water on higher ground. The court therefore required the defendant to clean the water and enjoined the defendant's discharge into the stream.[17] The Pennsylvania courts were also willing to enjoin active coal operations when acid mine discharge created a public nuisance. In *Sagamore*, the Supreme Court enjoined the interference when acid mine drainage damaged a municipal water supply.[18]

It was not until many decades later that social policy changed to favor the protection of victims of industrial activity by spreading the cost to users of industrial products. These policy changes expanded the protection afforded by the common law and spawned various regulatory statutes including the SMCRA and the CWA. The Pennsylvania Clean Streams Law[19] and common law riparian principles were applied in a landmark Pennsylvania Supreme Court decision, *Pennsylvania v. Barnes*.[20] In that case, Pennsylvania brought suit against a coal company to abate acid mine drainage flowing into the Susquehanna River from the company's closed underground mine works. The mine had opened in 1915, was acquired by the defendant in 1939, and was sealed in 1969 in accordance with applicable state law. Approximately one year later the mine began leaking acid mine water. The Pennsylvania Supreme Court reversed the natural use holding in *Sanderson* and ruled the acid pollution a common law nuisance, a violation of riparian principles, and a violation of the state's Clean Streams Law. Accordingly, the court ordered perpetual treatment of the discharge. This case is significant because it established common law liability independent of any regulatory violation of the company and held the company liable for the entire discharge without mitigating its responsibility based on the mining activities by others.[21] The *Barnes* court's decision also found the defendant liable for acid mine drainage which had occurred before Barnes owned the mine.[22]

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[17] *McCune*, 85 A. at 1102-3

[18] *Sagamoro*, 126 A. at 389.

[19] 35 PA. CODE §691.1 et seq. (1993)(enacted in 1937).

[20] Pennsylvania v. Barnes & Tucker Co., 371 A.2d 461 (Penn. 1977).

[21] Michael Winck, *Commonwealth v. Barnes & Tucker Co. - the Burden of Treating Acid Mine Drainage*, 80 W. VA. L. REV. 519, 538 (1978).

[22] See Barnes at 467. This decision by the Pennsylvania Supreme Court may be seen as a precursor to the Comprehensive Environmental Response Compensation and Liability Act of 1980 (hereinafter CERCLA codified as amended 42 U.S.C. §§9601-9657(1980)) permitting liability for pollution caused solely by prior activities).

Although common law riparian rights cases such as *Barnes* have expanded the common law protection against acid mine drainage, these rights still may not be asserted by landowners until after the damage has occurred.

> The replacement of common law actions for injunctions and damages by administrative regulation [was] inevitable because of severe limitations on the common law as a pollution control strategy. Private litigation is sporadic in place and time, while administrative regulations are universally applicable and often uniform in effect. Second, many private actions are inhibited by restrictive rules of standing and the expense of bringing litigation. On the other hand, administrative agencies automatically possess standing and agencies, with their professional enforcement staffs, are far less sensitive to expense than the average citizen. Third, in deciding whether an injunction should be granted, courts "balance the equities" between the interests of a plaintiff and society as a whole. The balance is more likely to be in favor of pollution control where a public agency, also representing society as a whole, is the plaintiff. . . .[23]

Although common law actions cannot alone fill the needs of modern pollution control, these actions are still a necessary part of protecting against acid mine drainage. One of the gaps which common law may still address is the "inability of federal and state officials to take enforcement action against dischargers who are in compliance with their discharge permits but are still causing injury to others."[24] For these reasons, many of the federal statutes include "savings clauses" similar to Section 505(e) of the CWA which provides: "Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek other relief (including relief against the Administrator or a State agency)."[25]

Accordingly, common law principles are valuable tools for riparian owners to protect against acid mine drainage. They are not however panaceas and can only be used to complement rather than replace relevant state and federal statues.

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[23] WILLIAM GOLDFARB, WATER LAW 263 (2d ed. 1988).

[24] *Id.* at 264.

[25] 33 U.S.C. § 1365(e).

III. THE SURFACE MINING CONTROL AND RECLAMATION ACT AND THE CLEAN WATER ACT

Although numerous statutes may affect coal mining operations, the SMCRA and the CWA primarily address the acid mine drainage problem.[26] The decades of water supply contamination in Pennsyl-

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[26] Two other statutes which may affect the control of acid mine drainage are the Resource Conservation and Recovery Act (hereinafter RCRA), 42 U.S.C. §§ 6901-6998 (1984) and CERCLA, 42 U.S.C. §§ 9601-9675. RCRA at 42 U.S.C. § 6905 addresses the application of RCRA and its integration with other statutes. Section 1006(a) provides: "Nothing in this chapter shall be construed to apply to (or to authorize any State, interstate, or local authority to regulate) any activity or substance which is subject to the Federal Water
Pollution Control Act [33 U.S.C.A. § 1251 et seq.]...." 42 U.S.C. § 6905(a). Section 1006(b)(1) provides: "The Administrator shall integrate all provisions of this chapter for purposes of administration and enforcement and shall avoid duplication, to the maximum extent practicable, with the appropriate provisions of the Federal Water Pollution Control Act [33 U.S.C.A. §1251 et seq.]." 42 U.S.C. §6905(b) (1980). Therefore, in order to avoid replication the statute directs EPA to provide incorporation of RCRA controls and provisions, to the extent practicable, within the confines of the CWA.

Section 1006(c) addresses integration between RCRA and SMCRA. According to this provision, the Department of the Interior (DOI) has exclusive responsibility for carrying out any requirements of RCRA Subtitle C, the hazardous waste rules that might apply to coal mine waste or to overburden for which a SMCRA permit might apply. LARRY MCBRIDE, JOHN PENDERGRASS, REGULATION OF COAL INDUSTRY FROM RESOURCE TO RECOVERY 664 (1992). Accordingly, it appears that any mining wastes, including acid mine drainage, which are regulated by SMCRA will not be enforced by the Environmental Protection Agency (EPA), but by the Department of the Interior (DOI). The requirements of RCRA must however, be incorporated into the SMCRA permit.

Congress passed RCRA in 1976 to protect human health and the environment by imposing regulations on the disposal of hazardous and solid wastes. RCRA's applicability is dependent on a finding that a substance is a solid waste within the meaning of the statute. RCRA defines "solid waste" to include liquid wastes of the mining industry. 42 U.S.C. §6903(27). 42 U.S.C. §6921(a) provides that the Administrator develop and promote criteria for the identification of hazardous wastes which would be subject to the provisions of Subchapter III of the statute. It is therefore relevant to examine 40 C.F.R. §261 to determine if acid mine drainage constitutes a solid waste under Subchapter III. It may be argued that acid mine drainage is abandoned and therefore a solid waste. Subchapter III which mandates various control provisions and permits applies to solid wastes which are determined to be hazardous wastes as defined by 40 C.F.R. §261.3 (1992). 42 U.S.C. §6921(b)(3)(A)(ii) provides an exclusion from hazardous wastes of "solid waste from the extraction, beneficiation and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore." This statutory exemption is known as the Bevill Amendment.

Because coal mining wastes are already extensively regulated under SMCRA, the EPA expressly added coal mining wastes to the mining waste exemption. Perhaps an argument could be structured that acid mine drainage is not the result of the extraction, beneficiation or processing of coal and not within the scope of the above mentioned exemption thus making it subject to Subchapter III.

The possible loss or inapplicability of the special waste exemption/exclusion does

vania, West Virginia, Maryland, Ohio, Indiana, Illinois, and Tennessee combined with the destruction of aquatic life in those states by acid mine drainage prompted the citizen pressure which resulted in the passage of SMCRA. Decades of polluted lakes and streams resulted in the passage of the CWA in 1972.

A. The Surface Mining Control and Reclamation Act

Section 510 of SMCRA[27] dictates the critical obligation of the regulatory authorities to deny a permit for mining unless the permit application demonstrates that reclamation can be accomplished.[28] This provision is the foundation of permitting decisions in areas where acid mine drainage may occur. SMCRA places the duty on

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not necessarily mean that coal mining wastes will be subject to the full panoply of Subchapter III requirements or that they be regulated by the EPA. JOHN-MARK STENSUAAG, HAZARDOUS WASTE LAW AND PRACTICE §6.18 (1986). The RCRA statute also addresses coal mining waste or overburden. 42 U.S.C. §6925(f).

While solid wastes of the mining industry may not be regulated under Subchapter III, RCRA provides that the Administrator of the EPA may bring suit in the appropriate district court to restrain any person who contributes to the handling, storage, treatment, transportation, or disposal of any solid or hazardous waste that may present an imminent and substantial danger to health or the environment. 42 U.S.C. §6973(a)(1984). Accordingly, the hazardous waste exemption would not be applicable because the emergency section applies to both hazardous and solid wastes. There may also be criteria developed by the EPA for states to use in regulating disposal of mining wastes under Title D of RCRA.

In an attempt to remedy the gaps left by RCRA, Congress enacted CERCLA. This legislation expanded EPA's regulatory authority to include actively operating hazardous waste sites as well as inactive sites closed prior to the enactment of the legislation. 42 U.S.C. §9603(c)(1980). CERCLA expanded EPA's ability to respond to an imminent hazard posed by a release or threatened release of a hazardous substance and to a release of a pollutant or contaminant that may present an imminent and substantial danger to public health and welfare. 42 U.S.C. §9604 (a)(1)(1980). This expands RCRA's scope because the statute not only covers hazardous substances but also pollutants and contaminants. 42 U.S.C. §9604 (a)(1)(B)(1980). As a result, solid wastes not currently characterized as hazardous under RCRA, such as mining waste, may be subject to response by the EPA under CERCLA. D. Dallmeyer, *Acid Mine Drainage*, 17 GA. L. REV. 982 (1983). Second, the Act establishes a lower threshold of certainty required before the EPA can respond, the EPA must show only the release "may present" a health hazard, not that it is presenting a hazard. 42 U.S.C. §9604(a)(1)(B) (1980).

Case law indicates a growing trend toward the use of CERCLA for addressing acid mind drainage issues even when the argument is made that mining wastes contributed minimally to the environmental problems. Although a more extensive discussion on the applicability of CERCLA and RCRA to acid mine drainage is warranted, it is beyond the scope of this paper.

[27] 30 U.S.C. § 1260.

[28] On the federal level the Office of Surface Mining and Reclamation Enforcement (OSMRE) in the Department of the Interior.

the permit applicant to demonstrate that reclamation can be accomplished with the permit applicant rather than placing the burden of demonstrating that it cannot be accomplished on the regulatory authority.[29] In order to comply with Section 510, the applicant must submit baseline information on surface and groundwater quantity and quality, determine the probable hydrologic consequences of the proposed operation, and disclose plans for hydrologic reclamation, ground and surface water monitoring.[30]

Although Section 510 provides the foundation for the control of acid mine drainage through permits, Congress has devoted several other portions of the statute to specific acid mine drainage control. Section 515(b)(10)(A)[31] requires that the surface coal mining and reclamation operations minimize disturbances to the prevailing hydrologic balance of the mine site and associated off site areas, to the quality and quantity of water in surface and groundwater systems, both during and after surface coal mining operations, and during reclamation by:

> avoiding acid or other toxic mine drainage by such measures as, but not limited to - (i) preventing or removing water from contact with [acid] producing deposits;(ii) treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses; (iii) casing, sealing, or otherwise managing boreholes, shafts, and wells and keep acid or other toxic drainage from entering ground and surface waters. . . .[32]

Additionally, Section 516 of SMCRA[33] addresses the surface effects of underground mining. Section 516 requires that each operator must minimize disturbances to the hydrologic balance and to surface and groundwater quality and quantity.[34] This requirement is virtually identical to that provided in §515(b)(10)(A). Furthermore, §516(b)(12) requires operators of new underground mines to locate openings so as to prevent gravity discharge of acid and iron waters from the mines.[35] This provision is important considering "the post-mining practice of simply sealing the mine opening and relying on the seal to prevent pollution."[36]

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[29] *Id.*

[30] 30 U.S.C. § 1257(b); 30 U.S.C. § 1260. *See also* 30 C.F.R. 715.17 (1995).

[31] 30 U.S.C. § 1265(b)(10)(A).

[32] *Id.* (citations omitted).

[33] 30 U.S.C. § 1266.

[34] *Id.*

[35] 30 U.S.C. § 1266(b)(12).

[36] JAMES MCELFISH & ANN BEIER, ENVIRONMENTAL REGULATION of COAL MINING

The applicable regulations essentially parallel the statutory provisions of SMCRA. Of primary significance are 30 CFR sections 816.41(a) and 817.41(a) both of which state: "mining and reclamation practices that minimize water pollution and changes to flow shall be used in preference to water treatment."[37] The particulars of this preventative approach are emphasized in subsections (b)(1), (d)(1), and (f)(1) which require special handling of acid forming materials. 30 CFR sections 816.102(f) and 817.102(f) require the coverage or treatment of exposed coal seams and acid-forming materials.[38]

The permit application regulations require the identification and analysis of acid forming materials and alkaline materials.[39] The regulations also require: (1) a determination of probable hydrologic consequences to identify whether such materials are present and could cause contamination, and (2) the submission of a hydrologic reclamation plan that "avoids acid or toxic drainage".[40] These regulatory requirements are designed to enable the regulatory authority to evaluate the proposed operation and understand the impact on water quantity and quality. "With this understanding, the regulatory authority may deny the permit, require redesign of the operation or impose relevant permit conditions."[41]

B. The Clean Water Act

The primary purpose of the Clean Water Act "is to restore and maintain the chemical, physical, and biological integrity of the nation's waters."[42] Unlike the SMCRA, the CWA does not directly address acid mine drainage. The Clean Water Act seeks to achieve fishable and swimmable water throughout the United States by utilizing technology based and water quality based effluent standards implemented through a national pollutant discharge elimination system (NPDES) permit.[43] The NPDES program may be administered by the states or retained by EPA.[44] The division of au-

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140-41 (1991).

[37] 30 C.F.R. §§ 816.41(a), 817.41(a) (1995).

[38] MCELFISH, *supra* note 36, at 141.

[39] 30 C.F.R. § 780.22(b) (1995).

[40] *Id.*

[41] MCELFISH, *supra* note 36, at 160.

[42] 33 U.S.C. § 1251.

[43] 33 U.S.C. § 1342.

[44] 33 U.S.C. § 1342(b). The principal authority to set the regulatory standards

thority between the Office of Surface Mining and Reclamation Enforcement (OSMRE), which is responsible for developing regulations and enforcement under the SMCRA, and the EPA, which has primary responsibility under the CWA, may cause confusion. One author has concluded that the EPA and its state counterparts have frequently assumed that regulation is being handled by OSMRE and its state counterparts.[45] OSMRE and the state mining agencies have made the converse assumption.

The CWA, written in very broad terms, make the discharge of any pollutant by any person unlawful except when in compliance with designated sections of the statute.[46] A pollutant is virtually anything other than sewage from vessels or fluids injected into an oil or gas well to facilitate production: a definition which would certainly include acid mine drainage as an industrial waste discharged into the water.[47] Discharge of a pollutant includes addition of any pollutant to navigable waters from a point source.[48] "Navigable waters" is defined broadly as the waters of the United States including the territorial seas.[49] The permit system applies only to discharges from point sources. A "point source" is defined as:

> any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.[50]

In its regulations accompanying the CWA, EPA has addressed coal mining point sources.[51] Subpart C of the applicable regulations address acid mine drainage. These regulations involve drainage from active mines and areas on or beneath land used or disturbed from the extraction, removal, or recovery of coal. This definition

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remains with the state. Only in the event that the states recommendation is deemed inappropriate shall the EPA set the state standards. *Id.*

[45] MCELFISH, *supra* note 36, at 159.

[46] 33 U.S.C. § 1311(a).

[47] 33 U.S.C. § 1362(6).

[48] 33 U.S.C. § 1362(12).

[49] 40 C.F.R. § 122.2(1994).

[50] 33 U.S.C. § 1362(14).

[51] 40 C.F.R. § 434(1994).

includes any coal refuse deposited on the earth.

At least one court has held that the term "point source" includes not only man-made conduits but also naturally occurring ditches and gullies that receive contaminated runoff from piles of mining wastes. In *Sierra Club v. Abston Constr. Co.*[52], the court stated:

> Nothing in the Act relieves miners from liability simply because the operators did not actually construct those conveyances, so long as they are reasonably likely to be the means by which pollutants are ultimately deposited into a navigable body of water. Conveyances of pollution formed either as a result of natural erosion or by material means, and which constitute part of a mine drainage system, may fit the statutory definition and thereby subject the operators to liability.[53]

According to this interpretation, it could be argued that the mouth of the mine could be a point source. It would constitute a tunnel by which acid mine drainage can enter the waters of the United States and accordingly be regulated as a point source.[54]

In *Sierra Club v. Lujan,*[55] a citizen suit filed under Section 505 of the CWA[56], the court granted an injunction against the Department of the Interior for past violations of a pollution discharge permit for the Leadville Tunnel in Colorado. This case supports the proposition that the mouth of a coal mine is a point source and would be regulated by a NPDES permit.[57]

A difficult issue occurring in the Appalachian coal fields is whether treatment ponds and treatment systems constitute point sources and may be regulated. For a long time, operators contended that treatment ponds in streams are not waters of the United States by citing the definition at 40 CFR section 122.2 which excludes some or all treatment ponds. The operators contended that effluent limits need only be met at pond outfalls. In December 1989, the U. S. District Court for the Southern District of West Virginia dismissed for lack of jurisdiction a suit filed by West Virginia operators against EPA over the instream ponds issue. The court deter-

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[52] Sierra Club v. Abston Constr. Co., 620 F.2d 41(5th Cir. 1980).

[53] *Id.* at 45.

[54] State of Colorado v. Idarado Mining Co., 707 F.Supp. 1227 (D. Colo. 1989).

[55] Sierra Club v. Lujan, 972 F.2d 312 (10th Cir. 1992).

[56] Codified at 33 U.S.C. § 1365(a).

[57] *Id.* at 425.

mined the EPA had not exceeded its jurisdiction in making its determination and thus dismissed the case.[58]

The Fourth Circuit ruled on a coal company's water treatment system and found it constituted a point source. In *United States v. Law*,[59] the sole officer and stockholder of Mine Management, Inc. was convicted of knowingly discharging polluted water into creeks without a NPDES permit.[60] The corporation had purchased a coal preparation plant, masses of coal refuse and a water treatment system.[61] The water treatment system was designed to "reduce the acidity and metal content of drainage from the pile."[62] The defendant appellants argued that the trial court's instructions to the jury were erroneous because they inaccurately stated that a defense did not exist even though some pollutants did not originate on the defendants' property.[63] However, the Fourth Circuit held that the treatment system clearly satisfied the statutory definition of a point source and, therefore, the origination of pollutants is not relevant in this case.[64] The court opined that because the appellants' treatment system was, as a matter of law, not part of the waters of the United States but instead a point source, the trial court's instructions were without prejudicial error.[65]

C. Bonds

The SMCRA requires every mine operator to post a reclamation bond before mining begins.[66] The function of the bond is to assure that the commitments set forth in the permit are fulfilled. Under the SMCRA, a bond must be set at an amount adequate to allow the regulatory authority to reclaim the mined land if the operator is unable or unwilling to fulfill its obligations.[67] Liability under the bond lasts for the life of the surface coal mining operation and for as long thereafter as the mine operator remains responsible

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[58] *Id.* at 426-7.
[59] United States v. Law, 979 F.2d 977 (4th Cir. 1992).
[60] *Id.* at 978.
[61] *Id.*
[62] *Id.*
[63] *Id.* at 979-80.
[64] *Id.*
[65] *Id.*
[66] *See* 30 U.S.C. § 1259(a).
[67] *Id.*

for revegetation under 30 U.S.C. section 1265.[68] There is a variety of bonding mechanisms which an operator may utilize. Operators may comply with bonding requirements by obtaining surety bonds, pledging collateral to regulatory agencies or, in some states meeting self-bond criteria.[69]

The SMCRA provides that "[t]he amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work had to be performed by the regulatory authority in the event of forfeiture."[70] The Office of Surface Mining and Reclamation and the majority of states with active coal mining regulations seek to satisfy this requirement through a "full cost bonding system" in which operators post bonds to cover all reclamation costs.[71]

In lieu of permit-specific, full-cost bonding, the SMCRA authorizes the Secretary of the Interior to "approve as part of a state or federal program an alternative system which will achieve the objectives and purposes of the bonding program pursuant to this section."[72] In Pennsylvania, all permitted areas are bonded at a specific amount per acre for coal extraction areas and a lower amount per acre for support areas.[73] "Bond amounts are higher for mineral extraction areas having highwalls in excess of 85 feet. . . . Forfeited bond amounts and permit fees, which are also collected, can be used only to reclaim forfeited sites."[74]

Under Pennsylvania law, the bonds are penal in nature and in the event of default the entire cost of the bond is forfeited without proof of actual reclamation costs.[75] If the bond amounts exceed actual reclamation costs, the surplus is not returned to the operator

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[68] 30 U.S.C. § 1259(b).

[69] A surety bond is a guarantee that the surety will pay the regulatory authority a fixed sum if the principal (the operator) fails to perform reclamation as required by the bond agreement. A collateral bond is an indemnity agreement executed by the permittee and supported by a deposit with the regulatory authority of cash, negotiable bonds, certificates of deposit, letters of credit or certified checks in the full amount of the bond. A self bond is an indemnity agreement executed by the permittee, the permittee's parent company or a qualified third party. 30 C.F.R. § 800.5(b) (1994), 30 C.F.R. § 800.21(a)(3) (1994), 30 C.F.R. § 800.5(c) (1994).

[70] 30 U.S.C. § 1259(a).

[71] Penina Lieber, *Pennsylvania Surface Mining Legislation: A Regulatory Mire*, 47 U. PITT. L. REV. 517 (1986).

[72] 30 U.S.C. § 1259(c).

[73] MCELFISH, *supra* note 36, at 103.

[74] *Id.*

[75] *Id.* at 104. *See also*, American Casualty Company v. Commonwealth, 441 A.2d 1383, 1389 (Pa. 1982) (Constitutional issues regarding takings were raised in this action but were rejected by the court).

or guarantor.[76] Rather, it is deposited in the supplemental fund for use on other forfeited areas.[77]

In contrast, the CWA does not require bonds since its primary function is to prohibit point sources from discharging pollutants without a permit. The typical industrial activity regulated by the NPDES permit is ongoing, but permits will be required even after mining ceases if a discharge occurs. This creates a weakness in the CWA for addressing acid mine drainage. Ongoing industrial activities have an incentive to comply with permits. If an industry does not comply, it may lose its permit and be forced to cease operations. This incentive for compliance does not exist when mining has already ceased. Moreover, it is difficult for the EPA to require a NPDES permit or compliance with a permit if the coal company is insolvent when the discharge is occurring and a responsible owner does not exist. This situation is exacerbated by EPA's policy not to actively require NPDES permits once the SMCRA reclamation bond is released.[78] Thus the CWA and its NPDES permits are not very effective in limiting acid mine drainage.

There is a definite divergence of opinion regarding bond requirements to cover injury to the environment as a result of acid mine drainage. Environmentalists believe that additional bonds are needed for mines permitted to operate in potentially acid-producing settings, and at a minimum additional bonds should be triggered when acid mine drainage appears at sites not identified as potential acid producers during permitting.[79] If acid mine drainage has not ceased and water coming from the backfill still requires treatment, environmentalists argue that no partial release of the bond should occur.[80] If the acid mine drainage is coming from another part of the site, the regulatory authority should decline a partial release, absent demonstration by the operator of a lack of any hydrologic interconnection between two portions of the site.[81] In the event of long term acid treatment obligations, the regulatory authority should consider requiring the operator to establish a fully funded trust fund

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[76] J. Burcat & S. Geary, *Surface Mining Regulation in Pennsylvania*, 57 TEMP.L.Q. 1, 23 (1988).

[77] *Id.* at 25

[78] *Id.*

[79] S.Dernbach, *Pennsylvania's Implementation of the Surface Mining Control and Reclamation Act*, 19 U. MICH. J.L. REF. 903, 921-28, (1986)

[80] *Id.* at 926.

[81] *Id.* at 927.

to cover costs.

The aforementioned views place a complete and total burden on the coal companies which are having a particularly difficult time during the trying economic times since the Act's passage. In an already weakened economic setting, the actual costs of bonding, permitting, compliance, and forfeiture to jeopardize further mining and reclamation of sites.[82] In short, operators often choose to go out of business rather than bear the burden of continuing to incur losses and added expenses.[83]

In 1984 Pennsylvania enacted amendments to its mining legislation in part to ease the coal industries' burdens.[84] In these amendments, incentives were created to lessen the likelihood of bond forfeiture provided the operator has made a substantial improvement in the condition of prior existing abuse.[85] This legislation was an attempt to neutralize Pennsylvania case law which had held that an operator may be liable for worsening pre-existing acid mine drainage.[86] It is believed that the mining companies cannot sustain CERCLA type liability whereby they would be accountable for 100 percent of the liability even though their actions contributed only a small portion of the resulting damage.[87] By enacting the 1984 Amendments, Pennsylvania attempted to balance the realities and costs of surface mining with the importance of a clean environment.

It appears that the best method to protect against acid mine drainage is to rely upon bonds or enforcement from the federal or state governments, and, moreover, for the coal companies and regulatory authorities to anticipate and prepare to handle problems before they actually occur.[88] Under the SMCRA, bonds cannot be released on sites that are discharging pollution. Acid mine drainage

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[82] Lieber, *supra* note 69, at 532.

[83] *Id.*

[84] 52 PA. CONS. STAT. § 1396.4(f) (1984).

[85] Lieber, *supra* note 69, at 542-43.

[86] *Id.*

[87] 42 U.S.C. §§ 9601-9675. Under CERCLA, the responsible parties or the government can cleanup the pollutants. If the government uses Superfund money, it can attempt to recover the money from potentially responsible parties (PRPs). In most instances, liability is joint and several. Therefore, even if a PRP contributed only a small amount of the hazardous substance he can potentially be liable for the entire cost of the cleanup.

[88] MCELFISH, *supra* note 36, at 142.

problems have in fact prevented bond release at numerous sites.[89] But, even in aggressive states such as Pennsylvania, bond amounts are often insufficient to undo permanent acid mine drainage.[90] A pro active method may be more effective.

D. Permits

Section 510 of the SMCRA requires the regulatory authority to determine before issuing a permit that reclamation can be accomplished and all performance standards are met.[91] This is particularly important in acid-producing areas, given the self- propagating nature of acid mine drainage, the prohibitive costs of perpetual treatment, and the risk of contamination of water wells or single event destruction of aquatic. Before issuing the permit, the regulatory authority must assure itself that the operator has thoroughly demonstrated its ability to prevent acid mine drainage through the proposed mining and reclamation plan.[92]

Permit applications in Pennsylvania must contain technical information. Maps must be furnished to illustrate land conditions, in addition to a reclamation plan, a timetable for accomplishing the objectives, and a plan for water drainage.[93]

In a 1978 pre-SMCRA case, Pennsylvania's highest court confirmed that the applicant carries the burden of proving acid mine drainage will not occur.[94] In *Harmon Coal Co. v Dept. of Environmental Resources*,[95] the court sustained a permit denial under Pennsylvania's Clean Streams Law[96] even though the applicant's acid-base accounting had shown a low potential for acid production.[97] The Commonwealth had produced only acid water samples from adjacent unreclaimed mine and surface soils.[98] The applicant had not carried its burden.

The majority of permitting under the SMCRA in potential acid-

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[89] *Id.*

[90] *Id.*

[91] 30 U.S.C. § 1260.

[92] MCELFISH, *supra* note 36, at 144-45.

[93] 52 PA. CONS. STAT. ANN. §30.56(a)-(g)(1992).

[94] Harmon Coal Co. v. Dept. of Environmental Resources, 384 A.2d 289, 291 (Pa. 1978).

[95] *Id.*

[96] 35 PA. CODE § 691.1 (1937).

[97] Harmon Coal Co. v. DER, 384 A.2d 289, 292 (Pa. 1978).

[98] *Id.* at n. 2.

producing conditions is, however, performed in "cookbook" fashion.[99] After submitting rudimentary acid base information, the operator pledges to observe the EPA treatment standards applicable to coal mining discharges under the CWA.[100] These standards can be met by channeling all water through a treatment pond and adding a neutralizing agent.[101] The economic feasibility of these treatment standards may be questionable.

E. Technology Based Permitting Under The Clean Water Act

40 CFR Part 434 establishes discharge requirements from coal mining point sources based on control technology. The regulations do not prescribe the use of a particular technology, but simply require compliance with numerical limits based on the capacities of the technologies examined.

Different standards apply to "reclamation areas" or areas where the land surface has been returned to the required contour and seeded or planted.[102] These different standards might be justified because such areas would discharge less pollution than open mine faces, exposed coal seams, and mining benches and highwalls.[103] This position often proves flawed, as iron and manganese discharges often occur in acid-forming areas even after surface reclamation.[104] EPA promulgated no effluent limitations for discharges from sites on which reclamation bonds under the SMCRA have been released.[105] This approach expressly relies on EPA's assumption that "the release of bonds by SMCRA authorities signifies their determination that post-mining pollution problems are abated and can reasonably be expected not to recur."[106] EPA has stated that if post-release discharges occur, NPDES permits are required.[107] Limitations are to be set on a case by case basis using best professional judgment.[108] Furthermore, although the EPA has not promulgated discharge limits for abandoned mines. Yet the U.S.

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[99] MCELFISH, *supra* note 36, at 145.
[100] *See* 40 C.F.R. § 434 (1994).
[101] MCELFISH, *supra* note 36, at 168.
[102] 40 C.F.R. § 434.11(k)-(l)(1994).
[103] MCELFISH, *supra* note 36, at 170.
[104] *Id.*
[105] *Id.* The bond provisions of SMCRA are discussed in Section D of this paper.
[106] 50 Fed. Reg. 41,296; 41,304 (1985).
[107] *Id.*
[108] *Id.*

Court of Appeals for the Fourth Circuit has determined that "post mining discharges from a point source . . . are illegal in the absence of an NPDES permit, the conditions of which the owner must meet."[109]

Part 434 contains an elaborate scheme of rainfall exceptions promulgated by the EPA in 1985. All Part 434 rainfall exemptions apply until the flow returns to a dry weather rate. This may be some time after a rainfall event. The EPA suggests that the dry weather flow will usually resume twenty-four (24) hours after the rain stops.[110] Part 434 standards are technology based and should be utilized in the permitting system; however, they cannot assure the goal of attaining fishable, swimmable waters since they do not incorporate the water quality requirements of the statute.

F. Water Quality Based Permitting Under The Clean Water Act

Water quality based permitting under the CWA begins by identifying the state water quality standards. These standards, approved by the EPA, consist of two parts: (1) a designated use for the waters, and (2) numerical or narrative instream water criteria to support the designated use.[111] All state water quality standards must "protect the public health or welfare, enhance the quality of water, and serve the purposes of [the Clean Water Act]."[112] The state water quality criteria may be expressed as numerical concentration limits or in narrative form.[113] Unlike technology-based limitations, water quality standards are not developed based on an evaluation of the capability of pollution control technologies but on the physical attributes of the water segment necessary to support the designated uses. Alternatively, the technology-based effluent standards place emphasis on the technological development as the engine for water quality improvement and assure the uniform adoption of advanced effluent standards across entire industry groups, independent of discharge locations or receiving water quality.

Once water quality standards have been set, NPDES permit limitations must be established to assure compliance, regardless of the availability or effectiveness of treatment technologies. The stan-

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[109] Webb v. Gorusch, 699 F.2d 157, 160 (4th Cir. 1983).
[110] 50 Fed. Reg. 41,296; 41,303-04 (1985).
[111] 40 C.F.R. § 131.10 (1994).
[112] 33 U.S.C. § 1313(c)(2)(A).
[113] 40 C.F.R. § 131.3(b) (1994).

dards must protect water quality to a "fishable/swimmable" use unless that use is precluded by natural factors or irreparable human-induced impacts, or if achieving that quality would produce an adverse "substantial and widespread economic and social impact."[114] In addition, EPA's anti-degradation policy, prohibits states from adopting standards that would degrade water quality below that necessary to support existing uses.[115] Waters of particularly high quality may not be degraded even to the state designated use level unless the permittee shows that important social and economic benefits will result.[116] Waters that constitute special national resources may not be degraded at all.[117]

Regulators must then develop permit-specific effluent limitations to assure that water quality standards are met. Water quality based effluent limitations may be more stringent than the technology-based limitations, and may force the development of new technology.[118] Development of these permit limitations requires sophistication on the part of regulatory agencies. They must evaluate the quantity and quality of discharges from the proposed mining operation and the quantity and quality of the receiving water.[119] In addition, they must assess all other pollution sources including other point source dischargers and nonpoint sources affecting the waters.

The NPDES permit may be issued to either individual point sources or specific areas defined by the EPA. The individual permit involves regulation of one direct discharger of water pollution. The NPDES program also includes authority to use general permits which are designed to allow the issuance of one permit imposing uniform limitations covering a specified class of dischargers within a defined geographic area. Eligibility of a facility for a group application will be determined by similarity of operations, waste discharge, and effluent limitations.[120] The application for a general permit contains two parts. The facilities submitting data on behalf of the group must be characteristic of the group as a whole in terms of number and range of facilities and other types of processes. This information will be used to develop the general permit.

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[114] 40 C.F.R. § 131.10(g) (1994).
[115] 40 C.F.R. § 131.12 (1994).
[116] 40 C.F.R. § 131.12(a)(2) (1994).
[117] 40 C.F.R. § 131.12(a)(3) (1994).
[118] 33 U.S.C. § 1311(b)(1)(C) (1987).
[119] MCELFISH, *supra* note 36, at 172.
[120] 40 C.F.R. § 122.26(c)(2) (1994).

A general permit does not have as many specific requirements on individual mines as individual permits. Since general permits contain effluent limitations applicable to all permit dischargers, it is difficult for EPA to determine which individual point source is violating the permit. Furthermore, because EPA does not require individual monitoring in general permits it is difficult to search for the violating point source.[121]

Pennsylvania is virtually the only state that utilizes water quality based permitting of mines.[122] The Pennsylvania Department of Environmental Resources develops permit-specific water quality based effluent limitations for all mining operations on high quality streams.[123] These limits are compared with the technology based limits and the more stringent of the two is applied. The permit applicant is afforded an opportunity to demonstrate that it is capable of complying with the prescribed limits. If it cannot demonstrate this, the permit is denied.[124]

The utilization of water quality standards is important, not only because it is required by law, but also because it serves a valuable planning function. The actual risk to the particular fish and aquatic life in the water where discharge would occur should be assessed prior to mining. Under the current systems utilized in most states, regulators and the public rely totally on technological standards that are not tailored to particular watersheds and their ecosystems.[125] Indeed, reliance on Part 434 alone may allow permits to be issued for discharge that can have adverse effects on receiving waters.[126]

Water quality impacts are the most lasting and environmentally harmful effects of mining. SMCRA was designed to address the gap left by the NPDES permitting process. The NPDES permit regulates discharge from point sources, not mining activities which makes it difficult to establish responsibility.[127] SMCRA was enacted specifically to regulate coal mining operations and places on the coal operators the burden of designing operations to prevent impacts rather than simply treating the water to attain effluent or water

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[121] Telephone Interview with W. Miller of the EPA (Aug. 4, 1993).

[122] MCELFISH, *supra* note 36, at 172.

[123] PA. DEP'T. OF ENVIRONMENTAL RESOURCES, BUREAU OF MINING & RECLAMATION, PROGRAM GUIDANCE MANUAL (1984).

[124] *Id.*

[125] MCELFISH, *supra* note 36, at 174.

[126] *Id.*

[127] *Id.* at 176.

quality guidelines. While SMCRA attempts to address the acid mine drainage problem by regulating the mining operations, the CWA addresses the purity of the water and requires all point sources including coal mines to attain it.[128]

G. Nonpoint Source Pollution Under The Clean Water Act

NPDES limits apply only to discharge from point sources to surface water.[129] As a practical matter, the permit requirement applies to structures such as impoundments, ditches, and treatment systems. During active mining, this coverage may be sufficient because regulations require that all drainage be either diverted from the mine site or controlled.[130] Since the Tenth Circuit decided in *Sierra Club v. Lujan* that the mouth of a coal mine may be classified as a point source, acidified water draining from the mouth of a mine may be regulated by a NPDES permit.[131] However, not all significant acid mine drainage come from a readily identifiable point source.

Some authors believe that nonpoint source pollution results from operations characteristic of mining activities including exploration, development, extraction, transport, reclamation, and waste disposal.[132] Pollution from mining activities include sediment,

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[128] Sections 301 and 307 of the Clean Water Act require EPA to prescribe effluent limitations for toxic pollutants. 33 U.S.C. §§ 1311,1317. During the early to mid-eighties, NPDES permits did not include provisions regulating toxic discharges from coal mines. U.S. EPA DEVELOPMENT DOCUMENT FOR EFFLUENT LIMITATIONS, GUIDELINES AND STANDARDS FOR THE COAL MINING POINT SOURCE CATEGORY (1982). EPA regulation of toxic materials resulting from acid mine drainage will most likely occur when environmentalists or citizens contest EPA's practice.

[129] 33 U.S.C. § 1342 The 1987 Water Quality Act amendments to the CWA provided explicit and firm deadlines for EPA regulation of storm water discharge. Section 402 establishes a moratorium until October 1, 1992 on permits for stormwater discharge with five exceptions for discharge associated with industrial activity. 33 U.S.C. §1342. After notice and comment, EPA issued a final stormwater rule on November 16, 1990 which defines discharges associated with industrial activity to include contaminated discharges from both active and inactive mines. 55 Fed. Reg. 47,990 (1990). EPA excluded from the category, however, discharges from inactive coal mines reclaimed under SMCRA. As a result of this exclusion, point source dischargers were not required to obtain NPDES permits until after the expiration of the storm water permit moratorium. This rule was challenged and upheld by the Ninth Circuit in American Mining Congress v. EPA, 965 F.2d 759 (9th Cir. 1992). It will be interesting to observe EPA's regulation of storm water discharges during the mid 1990s and thereafter.

[130] 50 Fed. Reg. 42,196 (1985).

[131] *Id.*

[132] W. ROGERS, ENVIRONMENTAL LAW - AIR AND WATER 155 (1986).

acids, and metals. Abandoned mine sites can often be the most significant contributors of mining related pollution.[133] Sources of nonpoint source pollution from abandoned mines include abandoned surface, underground waste, and tailings.

In 1987, the Clean Water Act was amended to place new emphasis on the control of nonpoint sources as one of the primary goals of the Act.[134] To effectuate control of nonpoint sources, Congress enacted section 319[135] which requires each state to assess the impact of nonpoint source pollution on its waters and to develop and submit to EPA a comprehensive management plan to control nonpoint source pollution. Section 319 imposes specific deadlines for completing lists of affected waters and management plans. It further requires states to incorporate specific deadlines in their plan, as well as requiring that states identify best management practices for addressing nonpoint source pollution.

Water quality standards may be utilized to help control the cumulative effects of nonpoint source acid mine drainage. Under section 303(d)(1)(A), states must identify all waters for which technology-based effluent limitations are insufficient to ensure compliance with water quality standards.[136] States must calculate a "total maximum daily load" (TMDL) for pollutants.[137] In short, the nonpoint source loads plus the point source loads can never exceed the receiving water's TMDL.[138] However, enforcement against nonpoint sources is difficult. Section 309[139] of the CWA is the vehicle to enforce effluent limitations and permit violations for point source dischargers. Accordingly, the permits would reduce effluent limitations for point source dischargers if water quality standards are exceeded. Overall water quality will improve, however, nonpoint source pollution will remain unabated because of Congress' omission regarding enforcement against nonpoint sources.

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[133] *Id.*
[134] *Id.*
[135] 33 U.S.C. § 1329.
[136] 33 U.S.C. § 1313 (d)(1)(A).
[137] P. THOMPSON, POISON RUNOFF 17 (1989).
[138] *Id.*
[139] 33 U.S.C. § 1319.

CONCLUSION: COMMON LAW, THE SURFACE MINING CONTROL RECLAMATION ACT, AND THE CLEAN WATER ACT

Riparian principles remain an effective tool to be used by private land owners to protect water supplies from acid mine drainage. Common law riparian principles were developed to protect individuals but may be manipulated to fit the social and economic agendas of the time.

Riparian principles are reactive in that they only become applicable once the damage is done. It will therefore allow the company to pollute without being restricted until a suit is filed. Once a suit is filed, the costs to the coal company and society are high. Common law riparian principles may still be effective to fill the gaps left by modern statutes and to complement citizen suits under the SMCRA and the CWA for damage caused by acid mine drainage.

Although SMCRA has alleviated many problems associated with acid mine drainage, many challenges still exist. SMCRA's primary goal is prevention and the burden of demonstrating that prevention is feasible rests on the permit applicant.[140] SMCRA must be properly utilized and requires an effective permit system and a sophisticated regulatory body.[141] Regulatory authorities should be able to scrutinize information and scientifically justify all decisions to issue permits.[142]

Inspection and enforcement under Sections 518 and 521[143] of SMCRA cannot compensate for a sophisticated and capable operator. Cleanup is extremely expensive and although coal companies attempt to maximize their short-term profits, it may well be within the companies' best interests to develop plans and technologies which will prevent acid mine drainage.

The bond requirements contained in SMCRA have proven to be burdensome and require some revision. Perhaps through the cooperation of the state and federal governments and coal companies, a middle ground may be reached which can alleviate acid mine drainage without bankrupting the coal companies.

The federal and state governments should also reward and encourage technology which inhibits acid mine drainage. Perhaps a

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[140] MCELFISH, *supra* note 36, at 140.

[141] *Id.* at 150.

[142] *Id.*

[143] 30 U.S.C. §§ 1268, 1271. These sections provide for administrative penalties, civil actions, criminal penalties and injunctions.

credit system similar to the Clean Air Act Section 111,[144] whereby a company benefits from technology which achieves a greater than required level of reduction, would benefit the mining industry. Perhaps if a company develops innovative technology which will prevent acid mine drainage, it could obtain credits from the state or federal regulatory system regarding its reclamation plan. Furthermore, this system could also be implemented regarding the cleanup if acid mine drainage is discovered. This would encourage and benefit the coal companies as well as achieving long-term protection of the environment.

The CWA has been very successful when dealing with point source pollution of our nations's water. Although it only deals with point sources and navigable waters, its technological requirements and effluent limitations can address the acid mine problem. Water quality based standards may also be effectively utilized when drafting a NPDES permit. The CWA, by itself, is not capable of protecting against acid mine drainage because of nonpoint source pollution.[145]

SMCRA was enacted, in part, to prevent damage to surface and groundwater as a result of mining. There should be greater exchange of information between the authorities that issue permits required under the SMCRA and the NPDES systems.[146] NPDES permitting does not always utilize hydrologic information accumulated during SMCRA permitting and conversely, SMCRA permitting does not use water quality information.[147] Both systems would be more efficient and comprehensive with the benefit of additional information.

Both SMCRA and the CWA should attempt to address acid mine drainage from different perspectives. SMCRA provides environmental standards for surface and underground coal mines. Some of the standards control the effects mines have on the hydrology of the site. The CWA, on the other hand, addresses the acid mine drainage problem, not through standards applicable to the mines, but by promulgating technology-based and water quality standards applicable to the water itself. The water may only contain certain level of contamination by acid mine drainage precursors, which have been determined by regulations. The coal companies must therefore use

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[144] 42 U.S.C. § 7411 (1990).
[145] 33 U.S.C. § 1317.
[146] MCELFISH, *supra* note 36, at 174-5.
[147] *Id.* at 175.

the technology mandated to achieve the desired level of cleanliness. Accordingly, SMCRA and the CWA complement each other and should be used simultaneously to effectively control acid mine drainage.

Riparian principles, the Surface Mining Control Reclamation Act, and the Clean Water Act and are all valuable to prevent and protect against acid mine drainage. Each addresses and attempts to rectify a problem that is destroying our watersheds and polluting our ecosystems. Together they can provide comprehensive protection against acid mine drainage.